800.1 GENERAL REQUIREMENTS

The fine aggregate shall consist of natural sand or, subject to approval, other inert materials with similar characteristics, or combinations having hard, strong, durable particles.

Fine aggregate from different sources shall not be mixed or stored in the same pile nor used alternately in the same class of construction or mix, without permission from the Engineer.

800.2 SPECIFIC REQUIREMENTS

A. Deleterious Substances: The amount of deleterious substances shall not exceed the following limits by dry weight:

Clay lumps.....	0.5%
Coal and lignite.....	0.3%
Shale and other materials having a specific gravity less than 1.95.....	1.0%
Other deleterious substances (such as alkali, mica, coated grains, soft and flaky particles).....	1.0%

The maximum amount of all deleterious substances listed above shall not exceed 2.0 percent by dry weight.

B. Soundness: When the fine aggregate is subjected to five cycles of the sodium sulfate soundness test, the weighted loss shall not exceed ten percent by weight.

When Class M (I) concrete fine aggregate is subjected to five cycles of the sodium sulfate soundness test, the weighted loss shall not exceed 12 percent by weight.

A satisfactory soundness record for deposits from which material has been used in concrete for five years or more, may be considered as a substitute for performing the sodium sulfate soundness test.

C. Organic Impurities: The fine aggregate shall be free from injurious amounts of organic impurities. Aggregates subjected to the colorimetric test for organic impurities and producing a color darker than the standard number 3 shall be rejected.

Should the aggregate show a darker color than samples originally approved for the work, it shall not be used until tests have been made to determine whether the increased color is indicative of an injurious amount of deleterious substances.

D. Alkali-Silica Reactivity (ASR) Requirements: When specified in the plans, the following items shall apply.

Fine aggregates from sources that have not been tested by the Department shall be submitted to the Materials and Surfacing Office for ASR testing 30 days prior to performing the concrete mix design.

ASR testing shall be performed in accordance with ASTM C1260, except that the gradation of the material used for testing shall be as produced from the source. The fine aggregate shall only be sampled at the source by a Department employee or in the presence of a Department employee.

Fine aggregate with a 14 day expansion value below 0.250 shall require Type II cement in the concrete mix. Fine aggregate with a 14 day expansion value of 0.250 or greater shall require Type V cement in the concrete mix.

When a fine aggregate supplier changes locations within the pit, the fine aggregate from the new location in the pit shall be resubmitted for testing.

When more than one source of fine aggregates is blended to meet the gradation specifications, the expansion value of the blended sands will be used for determining acceptability and type of cement required.

Blended sources will be treated as a new source and it shall be the responsibility of the Contractor to submit the blended samples for testing 30 days prior to the letting date.

E. Grading: Fine aggregate shall be well graded from coarse to fine and shall conform to the following gradation requirements:

Passing 3/8 inch (9.50 mm) sieve.....	100%
Passing No. 4 (4.75 mm) sieve..	95-100%
Passing No. 16 (1.18 mm) sieve.....	45- 85%
Passing No. 50 (300 m) sieve.....	10- 30%
Passing No. 100 (150 m) sieve.....	2- 10%

Class M (I) concrete fine aggregate shall conform to the above gradation requirements except, the percent passing a No. 100 (150 m) sieve shall be from 0 to 10 percent.

The percentage of material passing the No. 200 (75 m) sieve shall be such that the composite mixture of fine and coarse aggregate will conform to Section 820.2.

Blending of fine aggregate will only be allowed to correct for gradation. All fine aggregate sources shall meet the quality requirements individually prior to blending. The Materials and Surfacing Office shall be contacted prior to the blending of fine aggregates. The blending process shall be by an approved method that can accurately control the amount of each individual fine aggregate. The blending process shall be approved prior to starting.

F. Uniformity of Grading: The gradation requirements given in Section 800.2.E represent the extreme limits which shall determine suitability for use from all sources of supply. The gradation from any source shall be uniform and not subject to the extreme percentages of

gradation specified above. For the purpose of determining the degree of uniformity, a Fineness Modulus (FM) shall be made upon representative samples from sources proposed for use. Fine aggregate from any source shall maintain a fineness modulus within ±0.2 from the design mix fineness modulus. If the fineness modulus falls outside this limit contact the Concrete Engineer. A new or adjusted design mix may be provided. The uniformity of grading requirements do not apply to fine aggregate for Low slump Dense Concrete and Class M (I) concrete.

For determining the FM deviation from the representative sample, the average of the five most recent FM tests shall be used. Until five FM tests have been made, base the deviation on the first FM test; then on the average of all previously run FM tests.

For Portland cement concrete paving conforming to Section 380, the FM of the fine aggregate, as established by the mix design, will be from 2.40 to 3.10 (wide band). A 0.20 variation (narrow band) from the established FM target value will be allowed providing that the narrow band FM test results are within the wide band limits of 2.40 to 3.10.

G. Sampling and Testing:

Sampling.....SD 201
Gradation.....SD 202
Lightweight Particles.....SD 208
Soundness Test (Sodium Sulfate Solution,
five cycles)..... SD 220
Organic Impurities..... AASHTO T 21
Clay Lumps..... AASHTO T 112
Uniformity of Grading
(Fineness Modulus)..... AASHTO M 6